Biophysics 1969 vol.14 N5, pages 918-928

Investigation of proton relaxation in live plant tissues by the spin echo method

Fedotov V., Miftakhutdinova F., Murtazin S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The method of spin echo n.m.r. has been used to study the times of proton relaxation and the rate of proton exchange in various plant tissues. We have evaluated the possible mechanisms of the relaxation and shown that the times of proton relaxation in the main are determined by the interactions within the proton system consisting of three fractions exchanging between themselves. It has been established that in the test systems there is rapid (T22k12 > 1) exchange between the protons of the hydrate and free water with slow (k13T23 < 1) exchange between the protons of the OH groups of the cell walls and the protons of water. From the experimental values of the relaxation times we have estimated the amount of hydrate water (V) and its mobility (τC) and from the dependence of the spin relaxation time on tCP-the lifetimes of the protons of the OH groups of the cell walls for various plant tissues. © 1970.